

REMARKS

Claims 1-20 are now pending in the application. Claim 16 has been amended and claims 17-20 have been added. Claims 1 and 7 are independent. Reconsideration of this application, as amended, is respectfully requested.

Information Disclosure Statement

A copy of the PTO-1449 form attached to the Information Disclosure Statement dated September 4, 2003 was included with the Examiner's Office Action dated January 2, 2004. However, the references listed thereon were not initialed by the Examiner and the PTO-1449 form was not signed by the Examiner. It is respectfully requested that the Examiner initial and sign the PTO-1449 form attached to the Information Disclosure Statement dated September 4, 2003, and forward a copy with the next Office Communication in order to acknowledge consideration of the references listed thereon.

Rejection Under 35 U.S.C. § 103

Claims 1-13, 15 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Szilagyi et al., U.S. Patent No. 6,396,197. This rejection is respectfully traversed.

The present invention is directed to a piezo-film speaker and a motorcycle helmet including the piezo-film speaker. Independent claims 1 and 7 of the present invention recite a combination of elements including "a piezo-film curvedly supported to form at least one curved

portion ... having at least a radius (R) of curvature at each curved portion in a range of $R \geq 200$ mm or an area (S) of a principal surface of said piezo-film is in a range of $S \geq 40 \text{ cm}^2$."

With the above construction according to the present invention, it is possible to reproduce sound at a sound pressure, which is sufficiently audible, even when riding a motorcycle. In addition, it is possible to provide voice/sound reproduction at a sound pressure having a high tone quality and adequate volume. Applicant respectfully submits that the Szilagyi et al. reference relied on by the Examiner is insufficient to teach or suggest the above aspects of the present invention and is therefore incapable of accomplishing the above advantages of the present invention.

The Examiner relies on the Szilagyi et al. reference in order to render the presently claimed invention obvious. Applicant respectfully submits that Szilagyi et al. is insufficient to suggest the presently claimed invention. Specifically, the Szilagyi et al. reference discloses a piezoelectric material having some extent of curvature; however, there is no disclosure in Szilagyi et al. that the curvature is as substantial as the 200 mm curvature of the present invention.

However, as explained by the present inventor in the disclosure of the present invention, in a piezo-film, the quality of acoustic output is dependent on the radius of curvature of a curved portion of the piezo-film and the surface area of the curved portion. The possible combinations of radius of curvature and surface of a curved portion of a piezo-film is very large (almost infinite). In view of this, it is very difficult to determine the appropriate combination of radius of

curvature and surface of a curved portion of a piezo-film to obtain the most advantageous results.

It is the present inventors that have determined the most appropriate combination in order to obtain a high quality of acoustic output. Applicant respectfully submits that there is absolutely no teaching in the Szilagyi et al. reference relied on by the Examiner of the radius of curvature or the area of a principal surface of a piezo-film as recited in independent claims 1 and 7 of the present invention. In view of this, the Examiner's rejection is improper and should be withdrawn.

The Examiner recognizes that the Szilagyi et al. reference fails to teach the radius of curvature and area of a principal surface of a piezo-film. However, the Examiner has taken the position that it would be obvious to modify the Szilagyi et al. reference to arrive at the presently claimed invention. Applicant respectfully submits that the Examiner's rejection is improper and should be withdrawn. In the Examiner's Office Action, the Examiner states the following:

Since Szilagyi et al. do not specially restrict the radius or the surface area of the piezo-film speaker, and clearly suggest to provide a contour with variable radii of curvature for the speaker (claim 6); further, providing a desirable curved piezo-film speaker for a specific application is very well known in the art, it therefore would have been obvious to one skilled in the art at the time the invention was made to be motivated to provide a suitable piezo-film speaker with a desirable configurations [sic], such as a slightly curved configuration (with a rather large radius and sufficient active surface area), for the helmet, in order to generate desirable sound for the user of the helmet. (emphasis added).

First, the fact that Szilagyi et al. do not specially restrict the radius of the surface area of the piezoelectric material does not mean that there is a sufficient suggestion to modify Szilagyi et al. to have a specific radius or surface area.

Second, the Examiner's statement regarding Szilagyi et al. disclosing a variable radius of curvature is misplaced. The Examiner refers to claim 6 of Szilagyi et al., which states "wherein said shim has a contour with variable radii of curvature." However, the radius of curvature being referred to in claim 6 is not a radius of curvature formed by curvedly supporting the piezoelectric material as in the presently claimed invention. Referring to page 5, first full paragraph, and figure 4 of Szilagyi et al., the radius of curvature r_1 , r_2 , etc. is the radius of curvature of the edges of the shim 42, and not the radius of curvature of a curvedly supported portion as in the presently claimed invention. In addition, the shim 42 is not the piezoelectric material, but is located between two layers of the piezoelectric material 44 and 46 (see Figure 3). Accordingly, Szilagyi et al. does not, in fact provide any suggestion to provide a variable radius of curvature of a curvedly supported portion of a piezoelectric material as in the presently claimed invention.

Third, with regard to the Examiner's comments regarding well known prior art, Applicant respectfully requests the Examiner to provide evidence of this "well known" prior art. Applicant is unaware of any such teaching. As described at page 1, line 19 through page 2, line 12 of the present specification, the JP 7-327298 reference discloses the radius of curvature affecting the output efficiency of a piezo-film speaker. However, this reference is merely a general technique for increasing output. There is no recognition in this reference of controlling the quality of the

acoustic output by changing the radius of curvature and the surface area of the curved portion as in the present invention.

The Examiner is directed to MPEP § 2144.03 entitled “Reliance on Common Knowledge in the Art or ‘Well Known’ Prior Art.” In particular, this section of the MPEP states “[i]n very limited circumstances, it is appropriate for an examiner to take official notice of facts not in the record or to rely on ‘common knowledge’ in making a rejection, however, such rejections should be judiciously applied.” This section of the MPEP also provides support for requesting the Examiner to provide evidence of the “well known” prior art.

As the Examiner will note, the above section of the MPEP also indicates that it would not be appropriate to rely on “well known” prior art, if the Examiner does not provide sufficient evidentiary support for the “well known” prior art if the Examiner believes that the claims are properly finally rejected in the next Office Action. Accordingly, if the Examiner does not believe that the application is in condition for allowance, and the Examiner believes the claims should be finally rejected, it is requested that the Examiner provide Applicant with sufficient evidentiary support for the above “well known” prior art.

Fourth, Applicant submits that the Szilagyi et al. reference does not disclose a piezo-film speaker as recited in independent claims 1 and 7 of the present invention. Referring to column 1, lines 14-26 of Szilagyi et al., the piezoelectric material is disclosed as being made from, for example ceramic material, which is clearly not a film material as in the presently claimed invention. Accordingly, the Examiner’s rejection is improper for this additional reason.

In view of the above reasons, Applicant respectfully submits that the Examiner's rejection is improper and should be withdrawn. In addition, Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness. As the Examiner will note, MPEP § 2142, third paragraph (August 2001) states the following:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations."

Applicants respectfully submit that the Examiner has failed to meet the necessary burden in establishing a *prima facie* case of obviousness, since the Examiner has not provided any suggestion or motivation to modify the Szilagyi et al. reference relied on. The Examiner must first establish a *prima facie* case of obviousness before the burden shifts to the Applicants to rebut the *prima facie* case. The Examiner is shifting the burden to Applicants to prove non-obviousness without first establishing obviousness.

Referring to paragraph 4 of MPEP § 2142, the Examiner is placed with the initial burden "to provide some suggestion of the desirability of doing what the inventor has done." The Examiner must show that the references expressly or impliedly suggest the claimed invention or a convincing line of reasoning should be set forth as to why the modification is obvious. Since the Examiner has only relied on a variable radius of curvature for the shim 42, and since the only other suggestion provided by the Examiner is "well known" prior art, Applicant submits that the

Examiner has provided no suggestion or convincing line of reasoning in the present case. Accordingly, the Examiner's burden has not been satisfied.

The only rationale provided by the Examiner is a statement that the modification would be obvious, since the Szilagyi et al. reference is not restricted to any specific configuration for the film. Applicant respectfully submits that this is not establishing a *prima facie* case of obviousness.

The Examiner is attempting to avoid establishing a *prima facie* case of obviousness by shifting the burden to Applicant to prove non-obviousness without providing any teaching or suggestion to modify the references. As noted above, there must be some suggestion to modify a reference in order to establish a *prima facie* case of obviousness. The Examiner has set forth no suggestion for the modifications and therefore the rejection should be withdrawn. It is respectfully requested that the Examiner provide some suggestion in the prior art for modifying the combination of references to select the specific radius of curvature or the specific surface of the curved portion of the piezo-film. Since the references are silent with regard to such a suggestion, and since the Examiner has provided no other factual evidence of obviousness, it is requested that the Examiner withdraw the rejection under 35 U.S.C. § 103.

For an illuminating discussion on the burden placed on an Examiner to establish objective factual findings of record, the Examiner is referred to the recent Federal Circuit decision of *In re Lee*, 61 USPQ2d 1430 (CAFC 2002).

In re Lee involved an appeal of a decision of the Board of Patent Appeals in which *Lee* argued that the Examiner failed to provide a source of a teaching, suggestion, or motivation to combine the applied prior art to arrive at the claimed invention. The Board responded to these arguments by ruling that “[t]he conclusion of obviousness may be made from common knowledge and common sense of a person of ordinary skill in the art without any specific hint or suggestion in a particular reference.” *Id.* at 1432. The Federal Circuit overturned the Board's decision “for failure to meet the adjudicative standards for review under the administrative procedure act.” *Id.* at 1431. The Federal Circuit further stated that "the factual inquiry whether to combine references must be thorough and searching...it must be based on objective evidence of record...[t]his precedent has been reinforced in a myriad of decisions and cannot be dispensed with." *Id.* at 1433. The Court also stated that the USPTO is "not free to refuse to follow Circuit precedent" and "cannot rely on conclusionary statements when dealing with particular combinations of prior art and specific claims." *Id.* at 1434.

As stated herein above, the Examiner's modification of Szilagyi et al., relies exclusively on "well know" prior art, and the Examiner has not provided any factual support for the well known prior art. Therefore, the Examiner's position is very closely to the analysis disapproved by the Federal Circuit in *In re Lee*. As such, the Examiner's failure to provide factual support for a teaching, suggestion or motivation to modify Szilagyi et al constitutes legal error.

To the extent that the Examiner has taken the position that it would only require routine experimentation to arrive at the present invention, Applicant submits that the Examiner has not

demonstrated that the radius of curvature and surface of a curved portion of a piezo-film is a result-effective variable with regard to sound quality. A particular parameter must first be recognized as a result-effective variable, a variable that achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Since the Examiner has not shown that the prior art recognizes the relationship between radius of curvature and surface of a curved portion of a piezo-film, Applicant submits that there is insufficient teaching to optimize the radius of curvature and surface. It is applicants that have demonstrated that the radius of curvature and the surface of a curved portion of a piezo-film increases acoustic performance, not the references relied on by the Examiner or other prior art.

Further to this, Applicant respectfully submits that the Examiner has not provided any indication that the prior art was aware that the radius of curvature or surface of a curved portion of a piezo-film has anything to do with sound quality. This awareness was determined by Applicant. Applicant submits that this treatment by the Examiner is improper. "If there is no evidence that a person of ordinary skill in the art at the time of applicants' invention would have expected problem to exist at all, it is not proper to conclude that invention which solves this problem, which is claimed as an improvement of prior art device, would have been obvious to that hypothetical person." *In re Nomiya*, 184 U.S.P.Q. 607, 608 (CCPA 1975)(emphasis added). In the present case, the Szilagyi et al. reference does not recognize that the radius of curvature and surface of a curved portion of a piezo-film is important to sound quality. This awareness

appears only in Applicant's own disclosure. "There must be a reason apparent at time invention was made to person of ordinary skill in the art for applying the teaching at hand, or use of teaching as evidence of obviousness will entail prohibited hindsight." *Id.* at 608. This is exactly what the Examiner is doing in the present case. The Examiner has not provided any evidence of the awareness of a problem in the prior art and therefore one having ordinary skill in the art would not recognize to look for a solution. Accordingly, the Examiner is conducting prohibited hindsight.

It should also be pointed out that "a patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the 'subject matter as a whole' which should always be considered in determining the obviousness of an invention under 35 U.S.C. § 103" *In re Sponnoble*, 405 F.2d 578, 585, 160 U.S.P.Q. 237, 243 (CCPA 1969). Accordingly, the Examiner must provide evidence that one having ordinary skill in the art was aware of a problem before the Examiner can modify a prior art reference to arrive at the present invention. Since the Examiner has not provided evidence of an art recognized problem, the Examiner's rejection is improper and should be withdrawn.

With regard to dependent claims 2-6, 8-13, 15 and 16, Applicant respectfully submits that these claims are allowable due to their dependence on allowable independent claims 1 and 7, as well as due to the additional recitations in these claims.

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In view of the above amendments and remarks, Applicant respectfully submits that claims 1-13, 15 and 16 clearly define the present invention over the references relied on by the Examiner. Accordingly, reconsideration and withdrawal of the Examiner's rejection under 35 U.S.C. § 103 are respectfully requested.

Allowable Subject Matter

The Examiner has indicated that claim 14 is directed to allowable subject matter. Applicant greatly appreciates this indication by the Examiner. However, for the above-mentioned reasons, Applicant believes that independent claim 7 is directed to allowable subject matter. Therefore, claim 14 has not been rewritten in independent form at this time.

Additional Claims

Claims 17-20 have been added for the Examiner's consideration. Applicant respectfully submits that these claims are allowable due to their respective dependence on allowable independent claims 1 and 7, as well as due to the additional recitations in these claims.

Favorable consideration and allowance of additional claims 17-20 are respectfully requested.

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CONCLUSION

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently pending rejections and that they be withdrawn.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Paul C. Lewis (Reg. No. 43, 368) at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Very truly yours,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By 
Paul C. Lewis
Reg. No. 43,368

PCL/mmi

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000